



2023

Section: Obstetrics and Gynecology

Correlation between suture materials and wound infection after cesarean sections

Fahd Abdel Elal Al omda

Department of Obstetrics and Gynecology, Faculty of Medicine for Boys, Al-Azhar University, Cairo, Egypt

Ahmed Mohammed Saeed

Department of Obstetrics and Gynecology, Faculty of Medicine for Boys, Al-Azhar University, Cairo, Egypt

Mohammed Shehata Abdel Monem Taha

Department of Obstetrics and Gynecology, Faculty of Medicine for Boys, Al-Azhar University, Cairo, Egypt,
tahaaaaaaaaaa202094@gmail.com

Follow this and additional works at: <https://aimj.researchcommons.org/journal>



Part of the [Medical Sciences Commons](#), [Obstetrics and Gynecology Commons](#), and the [Surgery Commons](#)

How to Cite This Article

omda, Fahd Abdel Elal Al; Saeed, Ahmed Mohammed; and Taha, Mohammed Shehata Abdel Monem (2023) "Correlation between suture materials and wound infection after cesarean sections," *Al-Azhar International Medical Journal*: Vol. 4: Iss. 9, Article 26.

DOI: <https://doi.org/10.58675/2682-339X.2038>

This Original Article is brought to you for free and open access by Al-Azhar International Medical Journal. It has been accepted for inclusion in Al-Azhar International Medical Journal by an authorized editor of Al-Azhar International Medical Journal. For more information, please contact dryasserhelmy@gmail.com.

Correlation Between Suture Materials and Wound Infection After Cesarean sections

Fahd Abdel Elal Al omda, Ahmed Mohammed Saeed,
Mohammed Shehata Abdel Monem Taha*

Department of Obstetrics and Gynecology, Faculty of Medicine for Boys, Al-Azhar University, Cairo, Egypt

Abstract

Background: The most prevalent major operation worldwide, the cesarean section, is linked to a risk of surgical-site infection. Skin closure is an essential cesarean section stage. Uncertainty exists over the best suture material to use for subcuticular skin closure after cesarean (prolene, vicryl, and monocryl).

Aim and objectives: To correlate cesarean sections wound complications especially infection and sutures types used.

Patients and methods: The study will be conducted on 600 patients with cesarean section delivery at full term through Pfannenstiel incision and skin closure will be subcuticular in all cases. Follow-up period will be 6 weeks from delivery and they will be divided into three groups: group A: include 200 cases, skin closure after cesarean section using 2/0 prolene sutures. Group B: include 200 cases, skin closure using 2/0 vicryl. Group C: include 200 cases, skin closure using 2/0 monocryl.

Results: A statistically substantial variation existed between groups as regard to edema, infection, ecchymosis, seroma, hematoma, dehiscence, and reclosure moreover, presence significant difference between groups regarding to age, BMI, abortion, gravidity, hemoglobin, itching, hypertrophic scars, and previous cesarean.

Conclusion: Subcuticular skin closure with prolene sutures show the lowest rate of wound complication than vicryl and monocryl.

Keywords: Cesarean section, Monocryl, Suture materials, Vicryl, Wound infection

1. Introduction

In many industrialized nations, cesarean sections are the most frequently performed major surgeries. The prevalence of cesarean sections is rising globally today, and several factors are to blame for this, including maternal obesity, an aging maternal population, particularly in first pregnancies, an increase in multiple pregnancies, and the emergence of a new factor, maternal request for nonmedical reasons.^{1,2}

Five to ten times as many surgical-site infections occur after cesarean birth as after vaginal delivery. Even with frequent use of antibiotic prophylaxis, infection during cesarean delivery is still a major worry, especially for women who have nonelective surgeries (i.e. unscheduled cesarean section during labor, after membrane rupture, or for maternal or fetal

emergencies). Up to 12% of women who have a nonelective cesarean birth get postoperative infections even with the usual preincision prophylaxis; 60–70% of all cesarean sections are nonelective.³

An essential part of cesarean section is skin closure; it affects cosmetic outcomes, patient and surgeon satisfaction, and the existence or absence of wound problems. The optimal skin closure method should be quick, affordable, safe, and successful. It should also cause the least amount of pain to the patient and provide pleasing esthetic results. In addition, there should be less need for postoperative monitoring and a low incidence of wound complications.⁴

2. Patients and methods

The Department of Obstetrics and Gynecology, Faculty of Medicine, Al Azhar University, will

Accepted 21 March 2023.
Available online 30 December 2023

* Corresponding author.
E-mail address: tahaaaaaaaaa202094@gmail.com (M.S.A.M. Taha).

undertake the research, which is intended to be a prospective observational study.

The study will be conducted on 600 patients with cesarean section delivery at full term through Pfannenstiel incision and skin closure will be subcuticular in all cases follow-up period will be 6 weeks from delivery and they will be divided into three groups:

Group A: will include 200 cases, skin closure after cesarean section using 2/0 prolene sutures.

Group B: will include 200 cases, skin closure using 2/0 vicryl.

Group C: will include 200 cases, skin closure using 2/0 monocryl.

2.1. Inclusion criteria

Any age, any gravidity, full-term pregnancy (40 ± 2 weeks), elective cesarean section, and normal BMI (25–29.9).

2.2. Exclusion criteria

Urgent cesarean section, anemia, intrapartum or postpartum hemorrhage, history of surgical wound complications in previous operation either related to deliveries or not, chorioamnionitis, pregnancy complication, medical problems, hypersensitivity to suture materials, drug addiction, and chronic steroid use.

2.3. Statistical analysis of the data

- (1) Utilizing the IBM SPSS software program, version 24.0, data were input into the computer (IBM, Chicago, Illinois, USA).
- (2) Number and percentage were used to describe qualitative data. The χ^2 test was used to compare various groups with reference to categorical variables.
- (3) Mean and SD were used to explain quantitative data for regularly distributed data, whereas median, minimum, and maximum were used to communicate data with an aberrant distribution.
- (4) Independent t tests were utilized to compare two independent populations, whereas F tests (analysis of variance) were utilized to assess more than two populations.

2.4. Methods

All patients will be subjected to the following:

- (1) Detailed history.

- (2) Examination (abdominal and gynecological examination).

- (3) Investigation (swab from the wound in case of wound infection).

3. Results

Table 1 showed that age in prolene sutures group ranged from 23 to 38 years with median value 30.61 ± 4.69 , in vicryl sutures group ranged from 24 to 36 years with median value 30.48 ± 3.83 , and in monocryl sutures group ranged from 22 to 37 years with median value 29.86 ± 4.52 .

The BMI in prolene sutures group ranged from 25 to 29 with median value 27.13 ± 1.31 , in vicryl sutures group ranged from 25.20 to 29.80 with median value 27.42 ± 1.26 , and in monocryl sutures group ranged from 25.40 to 29.20 with median value 27.31 ± 1.15 . Regarding age and BMI, there was no statistically substantial variation between the three study groups.

Table 2 showed that gravidity 1 was higher in three studied groups with 79 (39.5%), 69 (34.5%), and 64 (32%), respectively. Gravidity in prolene sutures group ranged from 1 to 5 with mean value 1.98 ± 0.97 , in vicryl sutures group ranged from 1 to 4 with mean value 2.09 ± 0.99 , and in monocryl sutures group ranged from 1 to 4 with mean value 2.21 ± 1.02 .

Table 2 showed that parity 1 was higher in three studied groups with 87 (43.5%), 78 (39%), and 70 (35%), respectively. Parity in prolene sutures group ranged from 1 to 4 with mean value 1.89 ± 0.93 , in vicryl sutures group ranged from 1 to 4 with mean value 1.99 ± 0.98 and in monocryl sutures group ranged from 1 to 4 with mean value 2.12 ± 1.01 .

Table 1. Comparison of the three groups under study in terms of demographic data.

| | Prolene sutures group (N = 200) | Vicryl sutures group (N = 200) | Monocryl sutures group (N = 200) |
|---------------------------|---------------------------------|--------------------------------|----------------------------------|
| Age (years) | | | |
| Range | 23.00–38.00 | 24.00–36.00 | 22.00–37.00 |
| Mean | 30.61 | 30.48 | 29.86 |
| SD | 4.69 | 3.83 | 4.52 |
| Analysis of variance test | 1.690 | | |
| P value | 0.185 NS | | |
| BMI | | | |
| Range | 25.00–29.60 | 25.20–29.80 | 25.40–29.20 |
| Mean | 27.13 | 27.42 | 27.31 |
| SD | 1.31 | 1.26 | 1.15 |
| Analysis of variance | 2.933 | | |
| P value | 0.06 NS | | |

Table 2. Comparison between the three study groups regarding gravidity, parity, abortion, gestational age (weeks) and previous cesarean section.

| | Prolene sutures group (N = 200) [n (%)] | Vicryl sutures (N = 200) [n (%)] | Monocryl sutures (N = 200) [n (%)] |
|----------------------------------|---|----------------------------------|------------------------------------|
| Gravidity | | | |
| 1 | 79 (39.5) | 69 (34.5) | 64 (32.0) |
| 2 | 62 (31.0) | 65 (32.5) | 53 (26.5) |
| 3 | 43 (21.5) | 45 (22.5) | 60 (30.0) |
| 4 or more | 16 (8.0) | 21 (10.5) | 23 (11.5) |
| Range | 1.00–5.00 | 1.00–4.00 | 1.00–4.00 |
| Mean | 1.98 | 2.09 | 2.21 |
| SD | 0.97 | 0.99 | 1.02 |
| Analysis of variance | 1.690 | | |
| P value | 0.185 NS | | |
| Parity | | | |
| 1 | 87 (43.5) | 78 (39.0) | 70 (35.0) |
| 2 | 60 (30.0) | 65 (32.5) | 58 (29.0) |
| 3 | 41 (20.5) | 38 (19.0) | 51 (25.5) |
| 4 | 12 (6.0) | 19 (9.5) | 21 (10.5) |
| Range | 1.00–4.00 | 1.00–4.00 | 1.00–4.00 |
| Mean | 1.89 | 1.99 | 2.12 |
| SD | 0.93 | 0.98 | 1.01 |
| Analysis of variance | 2.672 | | |
| P value | 0.070 NS | | |
| Abortion | | | |
| Yes | 18 (9) | 20 (10) | 19 (9.5) |
| No | 182 (91) | 180 (90) | 181 (90.5) |
| χ^2 | 0.116 | | |
| P value | 0.944 NS | | |
| Gestational age (weeks) | | | |
| Range | 38.00–41.00 | 38.00–42.00 | 39.00–42.00 |
| Mean | 39.44 | 40.07 | 40.54 |
| SD | 1.08 | 1.53 | 1.10 |
| Analysis of variance | 39.152 | | |
| P value | 0.061 NS | | |
| Previous cesarean section | | | |
| Yes | 106 (53) | 109 (54.5) | 119 (59.5) |
| No | 94 (47) | 91 (45.5) | 81 (40.5) |
| χ^2 | 1.877 | | |
| P value | 0.391 NS | | |

χ^2 , χ^2 test.

P value was significant if less than or equal to 0.05.

Table 2 showed that abortion cases were 18 (9%), 20 (10%), and 19 (9.5%) in three groups, respectively, whereas nonabortion cases were 182 (91%), 180 (90%), and 181 (90.5%), respectively.

Table 2 showed that gestational age in prolene sutures group ranged from 38 to 41 with mean value 39.44 ± 1.08 , in vicryl sutures group ranged from 38 to 42 with mean value 40.07 ± 1.53 and in monocryl sutures group ranged from 39 to 42 with mean value 40.54 ± 1.10 . There was no statistical substantial variation statistical three study groups as regard gestational age, gravidity, abortion, and parity.

Table 2 showed that cases with previous cesarean section were 106 (53%), 109 (54.5%), and 119 (59.5%) in three groups, respectively, whereas cases without previous cesarean section were 94 (47%), 91 (45.5%), and 81 (40.5%), respectively. There was no statistical

substantial variation between the three study groups as regard previous cesarean section.

Table 3 showed that hemoglobin level in prolene sutures group ranged from 9.70 to 12.30 with mean value 10.95 ± 0.86 , in vicryl sutures group ranged from 9 to 12.30 with mean value 10.89 ± 0.90 , and in monocryl sutures group ranged from 8.90 to 12.70 with mean value 10.54 ± 0.92 . Regarding the hemoglobin level, there was no statistically substantial variation between the three study groups.

Table 4 showed that cases with redness were 15 (7.5%), 24 (12%), and 23 (11.5%) in three groups, respectively, whereas cases without redness were 185 (92.5%), 176 (88%), and 177 (88.5%), respectively. There was no statistically substantial variation between the three study groups regarding redness.

Table 3. Comparison between the three study groups as regard hemoglobin level.

| | Prolene sutures group (N = 200) | Vicryl sutures (N = 200) | Monocryl sutures (N = 200) |
|----------------------|---------------------------------|--------------------------|----------------------------|
| Hb (mg/dl) | | | |
| Range | 9.70–12.30 | 9.00–12.30 | 8.90–12.70 |
| Mean | 10.95 | 10.89 | 10.64 |
| SD | 0.86 | 0.90 | 0.92 |
| Analysis of variance | 6.552 | | |
| P value | 0.081 NS | | |

Table 4 showed that cases with edema were six (3%), 21 (10.5%), and 17 (8.5%) in three groups, respectively, whereas cases without edema were 194 (97%), 179 (89.5%), and 183 (91.5%), respectively.

Table 4 showed that cases with ecchymosis were four (2%), 19 (9.5%), and 14 (7%) in three groups, respectively, whereas cases without ecchymosis were 196 (98%), 181 (90.5%), and 186 (93%), respectively.

Table 4 showed that cases with infection were nine (4.5%), 19 (9.5%), and 22 (11%), respectively.

Regarding infection, there was a statistically substantial variation between the three groups that were examined.

Regarding infection, edema, and ecchymosis, there were statistically substantial variations between the three groups that were examined (Fig. 1).

Table 5 showed that cases with seroma were three (1.5%), 16 (98%), and 19 (9.5%) in three groups, respectively, whereas cases without seroma were 197 (98.5%), 184 (92%), and 181 (90.5%), respectively. Cases with hematoma were nine (4.5%), 15 (7.5%), and 26 (13%) in three groups, respectively, whereas cases without hematoma were 191 (95.5%), 185 (92.5%), and 174 (87%), respectively. Cases with dehiscence were eight (4%), 18 (9%), and 23 (11.5%) in three groups, respectively, whereas cases without dehiscence were 192 (96%), 182 (91%), and 177 (88.5%), respectively. Regarding seroma, hematoma, and dehiscence, there was a statistically substantial variation between the three groups under study.

Table 6 showed that cases with reclosure were one (0.5%), 12 (6%), and 15 (7.5%) in three groups, respectively, whereas cases without reclosure were 199 (99.5%), 188 (94%), and 185 (92.5%), respectively.

Table 4. Comparison between the three study groups as regard redness within and around the wound, wound edema, ecchymosis, and infection (pus).

| | Prolene sutures group (N = 200) [n (%)] | Vicryl sutures (N = 200) [n (%)] | Monocryl sutures (N = 200) [n (%)] |
|-----------------|---|----------------------------------|------------------------------------|
| Redness | | | |
| Yes | 15 (7.5) | 24 (12) | 23 (11.5) |
| No | 185 (92.5) | 176 (88) | 177 (88.5) |
| χ^2 | 2.626 | | |
| P value | 0.269 NS | | |
| Edema | | | |
| Yes | 6 (3.0) | 21 (10.5) | 17 (8.5) |
| No | 194 (97) | 179 (89.5) | 183 (91.5) |
| χ^2 | 8.878 | | |
| P value | 0.012 ^a | | |
| P1 | | 0.035 ^a | 0.041 ^a |
| P2 | | | 0.133 NS |
| Ecchymosis | | | |
| Yes | 4 (2.0) | 19 (9.5) | 14 (7.0) |
| No | 196 (98.0) | 181 (90.5) | 186 (93.0) |
| χ^2 | 10.081 | | |
| P value | 0.006 ^a | | |
| P1 | | 0.032 ^a | 0.049 ^a |
| P2 | | | 0.211 N.S. |
| Infection (pus) | | | |
| Yes | 9 (4.5) | 19 (9.5) | 22 (11.0) |
| No | 191 (95.5) | 181 (90.5) | 178 (89.0) |
| χ^2 | 6.065 | | |
| P value | 0.048 ^a | | |
| P1 | | 0.068 NS | 0.046 ^a |
| P2 | | | 0.511 |

χ^2 , χ^2 test.

P1 comparison between prolene sutures group and both vicryl suture and monocryl sutures.

P2 comparison between vicryl suture and monocryl sutures.

P was significant if less than or equal to 0.05.

^a Significant difference.

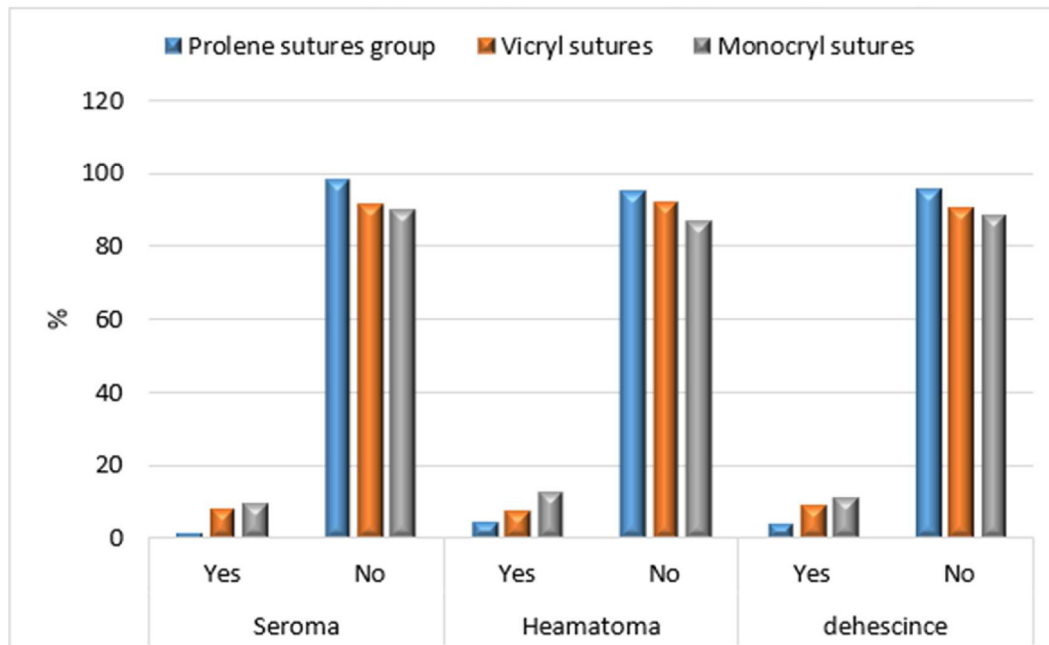


Fig. 1. Comparison between the three study groups as regard seroma, hematoma, and dehiscence.

Cases with hypertrophic scar were six (3%), six (3%), and 10 (5%) in three groups, respectively, whereas cases without hypertrophic scar were 194 (97%), 194 (97%), and 190 (95%), respectively. Cases with itching were five (2.5%), 11 (5.5%), and 12 (6%) in three groups, respectively, whereas cases without itching

were 195 (97.5%), 1892 (94.5%), and 188 (94%), respectively. There was statistically substantial variation between the three studied groups regarding reclosure, whereas there was no statistical substantial variation regarding hypertrophic scar and itching.

Table 5. Comparison between the three study groups as regard seroma, hematoma, and dehiscence.

| | Prolene sutures group (N = 200) [n (%)] | Vicryl sutures (N = 200) [n (%)] | Monocryl sutures (N = 200) [n (%)] |
|-------------------|---|----------------------------------|------------------------------------|
| Seroma | | | |
| Yes | 3 (1.5) | 16 (8) | 19 (9.5) |
| No | 197 (98.5) | 184 (92) | 181 (90.5) |
| χ^2 | 12.19 | | |
| P value | 0.002 ^a | | |
| P1 | | 0.021 ^a | 0.018 ^a |
| P2 | | | 0.255 |
| Hematoma | | | |
| Yes | 9 (4.5) | 15 (7.5) | 26 (13) |
| No | 191 (95.5) | 185 (92.5) | 174 (87) |
| χ^2 | 9.73 | | |
| P value | 0.008 ^a | | |
| P1 | | 0.046 ^a | 0.021 ^a |
| P2 | | | 0.046 ^a |
| Dehiscence | | | |
| Yes | 8 (4) | 18 (9) | 23 (11.5) |
| No | 192 (96) | 182 (91) | 177 (88.5) |
| χ^2 | 7.86 | | |
| P value | 0.020 ^a | | |
| P1 | | 0.036 ^a | 0.042 ^a |
| P2 | | | 0.421 |

χ^2 , χ^2 test.

P1 comparison between prolene sutures group and both vicryl suture and monocryl sutures.

P2 comparison between vicryl suture and monocryl sutures.

P was significant if less than or equal to 0.05.

^a Significant difference.

Table 6. Comparison between the three studied groups regarding reclosure, hypertrophic scar, and itching.

| | Prolene sutures group (N = 200) [n (%)] | Vicryl sutures (N = 200) [n (%)] | Monocryl sutures (N = 200) [n (%)] |
|--------------------------|--|-------------------------------------|---------------------------------------|
| Reclosure | | | |
| Yes | 1 (0.5) | 12 (6) | 15 (7.5) |
| No | 199 (99.5) | 188 (94) | 185 (92.5) |
| χ^2 | 12.356 | | |
| P value | 0.002* | | |
| P1 | | 0.046* | 0.038* |
| P2 | | | 0.311 |
| Hypertrophic scar | | | |
| Yes | 6 (3) | 6 (3) | 10 (5) |
| No | 194 (97) | 194 (97) | 190 (95) |
| χ^2 | 1.510 | | |
| P value | 0.470 NS | | |
| P1 | | 1.00 | 0.652 |
| P2 | | | 0.652 |
| Itching | | | |
| Yes | 5 (2.5) | 11 (5.5) | 12 (6) |
| No | 195 (97.5) | 189 (94.5) | 188 (94) |
| χ^2 | 3.222 | | |
| P value | 0.200 NS | | |
| P1 | | 0.452 | 0.311 |
| P2 | | | 0.287 |

Table 7 showed that 0 scar or just a line were 89 (44.5%), 69 (34.5%), and 72 (36%) in three studied groups, respectively. Mild ridge with minimal change in color were 87 (43.5%), 106 (53%), and 105 (52.5%), respectively, and severe scar (>0.5 cm ridge and red in color) were 16 (8%), 31 (15.5%), and 27 (13.5%), respectively. Regarding 0 scar or simply a line, moderate ridge with no color change, and severe scar (>0.5 cm ridge, and red in color), there was no statistically substantial variation between the three groups under study.

4. Discussion

The most frequent major surgical operation performed on women worldwide is a cesarean birth, and 5–12% of these cases result in complications from surgery site infections. Patients and the healthcare system are both heavily burdened by

infections and other wound problems after cesarean sections.⁵

Uncertainty exists over the best suture material to use for the subcuticular skin closure after a cesarean section. In the USA, vicryl and monocryl sutures are often utilized for subcuticular closure of transverse skin wounds after cesarean deliveries.⁶

Obliteration of dead space, equal stress distribution along deep suture lines, and preservation of tensile strength throughout the wound are all objectives of wound closure.⁷

Patient variables may contribute to wound healing complications include hypertrophic scars, broad scars, and wound dehiscence.⁸

The current work's objective was to correlate cesarean sections wound complications especially infection and sutures types used.

The Department of Obstetrics and Gynecology, Faculty of Medicine, performed the research, which

Table 7. Comparison between the three studied groups regarding 0 scar or just a line, mild ridge with minimal change in color and severe scar (>0.5 cm ridge and red in color).

| | Prolene sutures group (N = 200) [n (%)] | Vicryl sutures (N = 200) [n (%)] | Monocryl sutures (N = 200) [n (%)] |
|---|--|-------------------------------------|---------------------------------------|
| 0 scar or just a line | 89 (44.5) | 69 (34.5) | 72 (36) |
| χ^2 | 4.574 | | |
| P value | 0.102 NS | | |
| Mild ridge with minimal change in color | 87 (43.5) | 106 (53.0) | 105 (52.5) |
| χ^2 | 4.574 | | |
| P value | 0.102 NS | | |
| Severe scar (>0,5 cm ridge and red in color) | 16 (8.0) | 31 (15.5) | 27 (13.5) |
| χ^2 | 5.580 | | |
| P value | 0.061 NS | | |

was planned as a prospective observational study. Al-Azhar College.

The findings of our study indicated that there was no substantial variation in age or BMI between the three studied groups, and there was also no substantial difference in maternal history between the three studied groups. This finding was substantial because it allowed us to rule out the influence of demographic and maternal data on the outcome, leaving only the type of sutures as a variable factor.

In our results, the postoperative complication including edema, ecchymosis, and infection was significantly higher in vicryl and monocryl sutures more than prolene sutures.

Seroma, hematoma, dehiscence, and reclosure was significantly higher in both vicryl sutures and monocryl sutures group more than the prolene sutures.

In line with our findings, Bhawana et al.,⁶ research comparing the kind of suture used and the method used to close the subcutaneous fat and skin after cesarean sections, they found that there was a significant decrease in wound hematoma, seroma, and wound dehiscence after fat closure in prolene sutures group more than vicryl sutures group.

The majority of studies comparing absorbable and nonabsorbable sutures for skin closure during surgical procedures revealed no differences in wound complications or esthetic results. There has not been many research comparing monofilament and multifilament sutures for subcuticular closure after cesarean sections. One study comparing vicryl to monocryl for subcuticular closure during cesarean delivery was found in PUBMED when the search phrases 'Vicryl' OR 'polyglactin 910' AND 'Monocryl' OR 'poliglecaprone 25' AND 'cesarean' AND 'subcuticular' were used. There were no language or time constraints.⁹

In a randomized study of Indian women having emergency cesarean birth, Vats and Pandit Suchitra¹⁰ examined three kinds of suture materials, including vicryl ($n = 30$) and monocryl ($n = 30$). On postoperative days 4, 10, and 30, researchers compared pain and tenderness, discomfort from the wound, swelling and induration, wound discharge, and wound dehiscence separately. On days 4 and 10, but not day 30, they discovered higher rates of wound swelling, discharge, and dehiscence in the vicryl group.

Studies comparing its usage in CTD closures to prolene have shown it to be safe, indicating either might be used. Patient-reported outcome measures

and residual pain have been shown to be comparable, however persistent inflammation in vicryl-closed wounds may or may not be more common. This has been linked to vicryl's more extreme inflammatory response, although surgeons often accept it owing to how simple it is to remove or trim after the incision has healed.¹¹

Artificial or natural nonabsorbable sutures include surgical silk (nylon, polypropylene-prolene). As an isotactic crystalline stereoisomer of a linear propylene polymer, prolene, a monofilament suture, allows little to no saturation. The substance functions as a pull-out suture and does not cling to tissues (e.g. subcuticular closure). In addition, polypropylene maintains knots better than other synthetic monofilament materials. This substance causes just a little amount of tissue response and is physiologically inactive. Prolene does not degrade or weaken over time and keeps its tensile strength for up to 2 years. Infected and contaminated wounds may benefit from this material's ability to reduce the likelihood of sinus development and suture extrusion.⁷

4.1. Conclusion

In contrast, monocryl at cesarean is linked to similarly high rates of surgical site infection and other wound issues such as vicryl. Our data demonstrate that subcuticular skin closure using prolene sutures exhibits the lowest risk of wound complication.

Ethical approval and consent statement

The study had been approved by the ethical committee in Faculty of Medicine in July 2021.

Conflicts of interest

There are no conflicts of interest.

References

1. Nagy S. Changing trends and indications for cesarean section in the last few decades. *Orv Hetil.* 2014;155:1140–1146.
2. Al Rowaily MA, Alsalem FA, Abolfotouh MA. Cesarean section in a high-parity community in Saudi Arabia: clinical indications and obstetric outcomes. *BMC Pregnancy Childbirth.* 2014;14:92.
3. Tita ATN, Szychowski JM, Boggess K, et al. Adjunctive azithromycin prophylaxis for cesarean delivery. *N Engl J Med.* 2016;375:1231–1241.
4. Bhimeswar NG, Pradip SK, Rashmi B, et al. Wound complication among different skin closure techniques in the emergency cesarean section: a randomized control trial. *Obstet Gynecol Sci.* 2020;63:27–34.

5. Anderson DJ, Podgorny K, Berrios-Torres SI, et al. Strategies to prevent surgical site infections in acute care hospitals. *Infect Control Hosp Epidemiol.* 2014;35:605–627.
6. Bhawana B, Samariya M, Samariya A, Bagariya S. Comparison of suture material and technique of closure of subcutaneous fat and skin in caesarean section. *Int J Clin Obstet Gynaecol.* 2021;5: 143–149.
7. Islam A, Ehsan A. Comparison of suture material and technique of closure of subcutaneous fat and skin in caesarean section. *N Am J Med Sci.* 2011;3:85–88.
8. Xu B, Xu B, Wang L, et al. Absorbable versus nonabsorbable sutures for skin closure: a meta-analysis of randomized controlled trials. *Ann Plast Surg.* 2016;76:598.
9. Vats U, Pandit Suchitra N. Comparison of efficacy of three suture materials, i.e., poliglecaprone 25, polyglactin 910, polyamide, as subcuticular skin stitches in post-cesarean women: a randomized clinical trial. *J Obstet Gynaecol India.* 2014;64:14–18.
10. Weledji EP, Ngwane S. The management of keloids and hypertrophic scars. Darlington and County. *Durham Med J.* 2012; 6:39–45.
11. Kharwadkar N, Naique S, Molitor PJA. Prospective randomized trial comparing absorbable and non-absorbable sutures in open carpal tunnel release. *J Hand Surg Br.* 2005;30: 92–95.